

PASSIVE HARMONIC SWITCH MIXER

Abstract

A passive harmonic switch mixer is shown that is immune to self mixing of the local oscillator greatly reducing leakage noise, pulling noise, and flicker noise when used in a direct conversion receiver or direct conversion transmitter circuit. The passive harmonic switch mixer mixes an input signal received on an input port with an in-phase oscillator signal and a quadrature-phase oscillator signal and outputs an output signal on an output port. Because the quadrature-phase oscillator signal is the in-phase oscillator signal phase shifted by 90° , the passive harmonic switch mixer operates with a local oscillator running at half the frequency of the carrier frequency of an RF signal. Additionally, because the passive harmonic switch mixer has no active components, the DC current passing through each switch device is reduced and the associated flicker noise of the mixer is also greatly reduced.